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QUESTIONS TEACHERS DON'T ASK: THE IMPACT OF A MICROTRAINING
PROGRAM ON THE QUESTIONING STRATEGIES OF STUDENT TEACHERS

A Dissertation Presented

By

Jeanette Hilda Shopland

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

SEPTEMBER 1981

School of Education



Jeanette Hilda Shopland 1981

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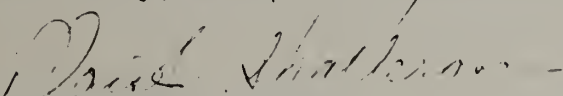
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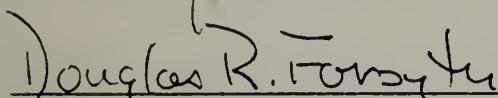
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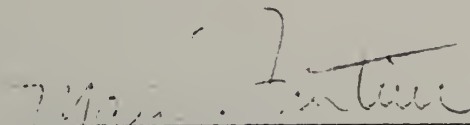
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ABSTRACT

QUESTIONS TEACHERS DON'T ASK: THE IMPACT OF A MICROTRAINING PROGRAM ON THE QUESTIONING STRATEGIES OF STUDENT TEACHERS

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Studies of teachers' questioning patterns were reviewed and a particular questioning strategy involving a variety of skills was developed. A research project to investigate the acquisition of these skills by student teachers was designed and implemented.

The questioning strategy designed for this study was based on humanistic principles of education combined with consideration of structural theories of development. It also gave due regard to the stressful nature of early teaching experiences by aiming for simplicity and general relevance.

The strategy involved learning to use open and closed questions with three areas of focus (personal, interpersonal and public). These were then extended to three levels which were defined by what is required of the student in response to the question: to give information, to generalize

from a body of knowledge, or to think creatively. The levels were named respectively information, generalization and expansion. The importance of waiting for a reasonable period of time after asking a question was also taught.

The research project was conducted using 30 student teachers at a college in Melbourne, Australia. Subjects were divided into an experimental and control group and measures were made before, immediately following and three months after the experimental treatment. The treatment consisted of three two-hour classes during which the questioning strategy was taught using a microtraining approach.

Tapes and transcripts of each subject teaching part of a practice class at a high school were collected at each of the three stages. Raters were hired and trained to categorize the teachers' statements obtained from the transcripts. Statements which were classified as questions were first categorized as open or closed, then assigned to one of the areas of focus and one of the levels. The tapes were used to measure wait time and teacher and student talk times.

A test of proportions was used to test for significance of differences between measures for the experimental and control groups at each stage and between measures for the experimental group at different stages. The only exception was wait time for which a t test was conducted.

Results supported previous research indicating that teachers tend to ask closed questions which seek information from the public domain. They also supported previous findings of very short wait times following the asking of a question.

The only significant changes to occur following the experimental treatment were in the measures of wait time. The scarcity of significant differences was attributed partly to difficulties which were encountered in conducting the research. These included small numbers of subjects, time constraints and problems with taping. The effect of expectations of supervising teachers upon the willingness of subjects to try new ideas was also suggested as inhibiting change. Furthermore, since the college in general does not present a humanistic view of education the underlying ideals of the strategy were strange and possibly unacceptable to many student teachers. It has been suggested that further research, taking these factors into account, be designed and implemented.

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C H A P T E R I

INTRODUCTION

This study deals with types of questions used by teachers. In particular the study proposes to:

- (1) develop a questioning strategy which teachers may use to increase classroom effectiveness, and
- (2) investigate the acquisition of these questioning skills by student teachers.

Designing a questioning strategy.

From as early as 1912, researchers have been studying teachers' questioning practices. Over the intervening years, a large number and variety of studies have been conducted and the picture is now fairly clear. Left to their own devices, teachers tend to ask questions which require students only to demonstrate knowledge of facts. They also ask a large number of questions, often not giving their students sufficient time to reply. (A summary of the research in this area is given in Chapter II.)

In response to the need for improved questioning practices, some teacher educators have designed and implemented programs aimed at training teachers in a variety of new approaches. Most of these approaches have focussed exclusively on raising the level of cognitive functioning required for the question to be answered. (See for example, Atwood and Stevens, 1976).

Recent developments in humanistic approaches to education have placed emphasis on the "whole person" (Lyons, 1971). Consequently any suggestions for improvements to teaching practices must take into account cognitive, emotional, physical and spiritual aspects of the learner. In fact, previous neglect of all but cognitive development would seem to justify weighting the other areas in an attempt to redress the balance.

If teacher educators are practising humanistic principles, they too will take into account the total needs of their students. Teaching is an occupation which places great personal demands on the individual and requires the use of very complex skills. Studies of student teacher concerns have clearly demonstrated the stressful nature of preparation for teaching. The questioning strategy under consideration is designed to take this stress into account. It is composed of separate skills, each of which can be acquired and used effectively alone. Once acquired, the skills are widely applicable, being suitable for almost any teaching situation. Thus the learner - teacher can acquire useful skills in manageable stages.

In Chapter II of this study a detailed discussion of the literature relating to teachers' questioning patterns and programs for developing new approaches is presented. Chapter III deals with findings from research into humanistic education, structural developmental theories and the concerns of student teachers. These are combined to produce a suggested strategy for questioning. A feature of this strategy is the emphasis on both idealogical and practical considerations.

Learning the skills of questioning.

As elaborated in Chapter III, microtraining (Ivey and Authier, 1978) is a highly effective and well researched approach to the acquisition of interpersonal skills. Consequently it has been chosen as the method for teaching this questioning strategy. The procedure involves the presentation and explanation of a particular skill followed by short periods of practice with videotaped feedback. Ideally, this will provide student teachers with the opportunity to learn skills in manageable stages at a pace geared to each individual.

The present study.

A study of the acquisition of the proposed questioning strategy has been conducted and the details are presented in Chapter IV. The subjects were 30 undergraduate students at a teachers' college in Melbourne, Australia. The training procedure used was a modified form of micro-training.

CHAPTER II

THE USE OF QUESTIONS BY TEACHERS: A LITERATURE REVIEW

The classroom teacher probably devotes more time and thought to asking questions than anybody since Socrates. One might even say the teacher is a professional question maker. (Aschner, 1961, p.44)

The use of questions by teachers has been the focus of a wide variety of research studies. These have clearly established that teachers spend much of their time in class asking questions and that most of these questions only ask students to demonstrate knowledge of facts. Studies of the effects on students of different styles of questioning have produced some interesting but as yet inconclusive results. Many educators are now turning their attention to the design of strategies which will lead to improved student outcomes by increasing the effectiveness of teachers' questioning skills.

Why is this an important area of study?

Questioning is a predominant aspect of most teachers' classroom practices. A study by Corey (1940) across six classes, resulted in a finding that, on average, the teacher asked a question once every 72 seconds. Resnick (1972) found that 36 percent of all teacher remarks were questions. When only extended interactions were analyzed this figure became 54 percent. Gall (1970) and Riegler (1976) both report studies spanning the last fifty years, all giving clear support to the fact that questioning is the dominant mode of teachers' interactions with students.

While the importance of questioning based on its prevalence has been clearly established, there is a relative lack of research indicating the effects of questions on students. The work which has been done has mainly

concentrated on relationships between higher order questions (as defined by Bloom's taxonomy) and student outcomes. Several studies have indicated that training teachers to include higher cognitive questions in their repertoire results in higher cognitive responses by the students (Williams, 1970; Cole, 1973; Atwood and Stevens, 1976).

When student achievement is considered, the picture is less clear. A study by Rogers and David (1970) failed to show any difference, but one by Hunkins (1968) demonstrated increased achievement when teachers used higher order questions. Over the course of a month, one group of sixth grade students was taught with an emphasis on asking knowledge questions while a parallel group was asked mainly questions requiring analysis and evaluation. The performances of both groups were measured using a multiple choice test, and the analysis-evaluation group scored significantly higher on subtests composed of analysis and evaluation questions. A problem with this study, however, is the use of multiple choice questions as a measure of achievement in areas for which "correct" answers should not exist. Another study by Hunkins (1970) failed to show any difference in critical thinking when teachers used higher order questions. In explaining his results, Hunkins pointed out that the skills encouraged by such questions probably require a discussion format for their operation, which suggests that a written test was an inappropriate measure. He also recognized the limitations of an "either-or" approach to higher and lower order questions and concluded that questioning should be part of a strategy and result from a build up of simpler questions.

It seems that questioning is a much used teaching activity with little evidence as to its effects, even in a global sense. Much more research needs to be done to investigate appropriate forms of questions on the basis

of particular student attributes and needs, and directed towards specific outcomes.

What kinds of questions do teachers typically use?

In order to answer this question, a classification system must be used, which in itself places limitations on the findings. Riegler (1976) has discovered 21 such classifications which have been devised in recent years. Those which are oriented to specific subject areas will not be reviewed here because of a commitment to seeking questioning approaches with general relevance. In the latter category, the system devised by Bloom (1956) in his "Taxonomy of educational objectives: Cognitive domain" is the acknowledged leader.

Bloom has defined six kinds of thinking with forms of questioning appropriate to each one. Knowledge is separated from intellectual skills, the lowest level of which is comprehension. Higher order skills are application, analysis, synthesis and evaluation. Bloom considers that in typical classrooms, questions generally do not require students to go beyond the levels of knowledge and comprehension. There is a large body of evidence which indicates that questions may be even more limited, by far the greatest proportion of teacher questions requiring simple recall of information (Arnold, 1973; Atwood and Stevens, 1973; Clegg, Manson, Ochoa, Nichols and Williams, 1970; Crump, 1969; Davis and Tinsley, 1967; Godbold, 1970).

Gall (1970) has pointed out a problem with most classification systems, that they are based on the cognitive processes presumed to be required to answer the question. This may be inappropriate since a question which appears to require critical thinking, for example, may be answered by recalling material from a text book. Riegler (1976) has attempted to

overcome this difficulty by delineating categories based on semantic cues within the question rather than inferred processes within the person responding. One useful aspect of his system is the recognition that there are three distinct classes of question: interrogative, rhetorical and ambiguous, the latter two having been ignored in much of the literature. With regard to the problem of inferred processes, he has made it possible for researchers to categorize questions more accurately, but this seems to sidestep rather than solve the problem. For example, his question "Is Gerald Ford a good president?" can be unequivocally classified as interrogative, analytical: non-normative (value) judgement, yet the fact remains that a student could either give an answer direct from a book or as a result of a personal valuing process. Riegler's contribution has served to highlight the unwarranted assumption of many researchers that by looking at the form of a question you can know with relative certainty what processes occur in producing an answer. Much of the educational relevance will be lost, however, if these processes are simply ignored.

A further criticism of existing classifications relates to important categories which are omitted. A list of these omissions compiled by Gall (1970) includes questions which are designed to cue students to improve an initially weak response, create a discussion atmosphere, stimulate a sense of curiosity and enquiry, and guide learning of problem-solving, behavioral and affective skills. This last point is noteworthy as most of the literature on questioning concentrates only on cognitive skills. Since Krathwohl, Bloom and Masia produced their book "Taxonomy of educational objectives: Affective domain" in 1964, it has often been noted that this has elicited meagre research in contrast to the response of researchers to its counterpart in the cognitive domain. It should be noted that those who criticize

existing taxonomies do so, not so much because teachers are actually using questions which do not fit the categories, but rather because they consider that there are many other forms of questions which teachers should ask.

It is important to consider not only the effects of the content of individual questions, but also the style of questioning used by teachers. Godbold (1973) in making this distinction has defined three areas for consideration in relation to questioning strategies. These are the rate of questioning, the sequencing, and interactions between the teacher and students.

It has already been noted that students are often subjected to a rapid rate of questioning. Wright and Nuthall (1970) found a tendency on the part of many teachers to repeat questions or to answer their own questions. When teachers were sufficiently skilled to ask one well formulated question at a time and wait for an answer, student achievement was significantly improved. Rowe (1969) discovered that teachers tended to wait an average of only one second before rephrasing, redirecting or making some other move. When teachers were trained to pause after asking a question, dramatic changes in student responsiveness occurred. These will be presented in detail in Chapter III.

Taba, Levine and Elzey (1963) investigated classroom interactions and emphasized the role of questions in lifting the level of student responses. They concluded that teachers were usually not sufficiently aware of the level at which it was appropriate to begin questioning. From their studies they found that when teachers were trained in pacing their questions in keeping with student needs, even those students previously designated "slow learners" could proceed to high levels of thinking.

A study by Sinclair and Coulthard (1975) emphasized the importance of feedback in a questioning strategy. They report having observed some teachers who, in an attempt to get away from the "right answer" approach to questioning did not react at all after receiving pupils' responses to questions. The result, not surprisingly, was that the interchanges dried up. This example illustrates how teachers may be encouraged to give up familiar styles of interaction without being given any help to find replacement behaviors. It seems that these teachers needed assistance to develop a repertoire of responses which included alternatives to evaluation.

Thus it is clear that studies of teachers' questioning practices indicate that the questions themselves are often of a low level, and that they are used in ways which are not conducive to pupil growth. This leads to a consideration of alternative approaches: the design of improved strategies of questioning and the training of teachers in the use of these skills.

What questioning techniques are currently being advocated?

Once research findings established the prevalence of knowledge questions asked by teachers, the most obvious area for development appeared to be in the direction of training teachers to ask higher order questions. A good example of this approach is that of Sanders (1966) who, in his book "Classroom questions: what kinds?", set out to systematically lead teachers to be able to identify and construct higher order questions. He recognized the limitations of such questions when, in the first chapter, he pointed out the need for a sense of perspective on the part of teachers:

Teachers who concern themselves with the possible uses of the taxonomy of questions must not lose sight of the fact that

concern for the quality of thought in the classroom is inadequate as a total philosophy of education. . . . Educators took a great step forward when they discovered that they must be concerned with the whole child - not simply with his mind. (p.11)

Although Sanders does not appear to consider that teachers may be able to show concern for the whole child within appropriately developed questioning strategies, he has at least recognized the need for such concern.

One answer to this need has been presented by Hunkins (1976) with an approach to questioning based on the promotion of student involvement. He has taken Bloom's taxonomy for the cognitive domain and that of Krathwohl et al. for the affective domain and for each category has generated examples and a guide for producing such questions. He has also presented planning activities as a guide to their use. Although Hunkins intends his book to be used by both practising and prospective teachers, it seems more appropriate for the former. The attention to detail which should prove stimulating and enriching for experienced teachers may well be overwhelming if presented to student teachers, especially in view of the complexity and variety of other experiences which typically occur during training.

Microtraining is a widely used training model for teachers which includes a unit on questioning as one of the five clusters of basic teaching skills (Allen and Ryan, 1969). Teachers' questioning behavior is divided into four aspects: fluency in asking questions, probing questions, higher order questions and divergent questions (Allen et al. 1969). Fluency refers to the number of 'logical' and 'relevant' questions asked. Probing questions require students to elaborate upon a previous response or provide

a rational justification for their response, they refocus attention upon an issue, prompt or give hints, and involve others by asking them to react to the first answer. Higher order questions are defined as "questions that cannot be answered merely from memory or simple sensory description" (Allen et al., 1969, p.35). Divergent questions are described as follows:

Such a question has no 'right' answer. It is an open-ended question, requiring students to use both concrete and abstract thinking to determine for themselves an appropriate response. Students are free to explore the problem in whatever direction they prefer; they are asked to think creatively, to leave the comfortable confines of the known and reach out into the unknown. (Allen et al., 1969, p.53)

Research into the possible applications of microteaching in the training of counselors (Ivey, Normington, Miller, Morrell and Haase, 1968) has resulted in advances in a number of areas, including teacher training (Ivey and Authier, 1978). Initially, the microcounseling approach identified twelve skills which could be shown to facilitate counseling interactions regardless of the particular theoretical approach of the counselor. It was quickly realised that these skills are facilitative in all interpersonal communication, and they have subsequently been used with a variety of groups including volunteers and paraprofessionals in health settings, psychiatric patients, students and teachers. The twelve counseling skills have been organized into a taxonomy of microtraining quantitative skills with three basic categories: attending skills, influencing skills and a focus dimension. The questioning skills come within the attending category and consist of closed questions which can be answered with only a few words and open questions which allow room for exploration. The concept of focus is also applied to questions.

One of the strengths of microtraining is its adaptability, and the development of modified versions for use in special settings has been encouraged by Ivey (1978). An example of such a modification is the taxonomy of interpersonal skills for teachers developed by D. and M. Sadker (1972). Their particular focus is on teaching to encourage affective learning and they have identified three clusters of teacher behavior: eliciting pupils' expressions of feelings and values, clarifying pupils' expressions of feelings and values and encouraging alternative behaviors. One way of eliciting expressions of feelings and values is by using inventory questions. These are intended to focus on present awareness in the areas of the students' feelings, thoughts, actions and behavior. In the second cluster, clarifying questions are identified as those which ask the student to begin analyzing feelings, values and behavior in relation to these values. Formats in which these questions may be presented involve the consideration of other points of view, assigning value priorities and recognizing and clarifying patterns. This approach borrows extensively from Weinstein's "trumpet" model (Weinstein, 1973).

A pilot study conducted by Sadker and Sadker (1977) showed that teachers did use more affectively oriented questions when trained in these skills. The authors have stressed the need for further research in this area, particularly directed towards refinement of the taxonomy. This taxonomy represents, however, an encouraging forward move for at least two reasons. First, it is an example of how the microtraining model may be specifically redesigned for use in teacher training. In addition, the skills it seeks to teach focus exclusively on affective classroom goals,

in contrast to the majority of training programs which are dominated by cognitive goals. While the stated goals of schools often include the social and emotional wellbeing of their students, rarely are teachers given any training in skills designed to promote these ends.

Another approach with affective emphasis has been developed and researched by Stahl (1976). His questioning strategy was initially designed for values clarification procedures in social studies classrooms, but is potentially applicable in other areas. Questions are classified according to four interrogative modes: empirical, relational, valuing and emotive. Empirical questions ask for particular feelings, thoughts and perceptions, while relational questions require that the empirical data be interrelated or connected with previous discussions. Students are asked valuing questions relating to their assessment of good and bad aspects of the given situation. They are also asked to describe their feelings about the situation, these questions being categorized as emotive.

An important aspect of Stahl's research was his recognition that questioning does not occur in isolation, and that changing behavior in one area may have effects in other areas. His results indicated that students taught by teachers trained in these questioning skills did increase the number of values clarification responses they gave. Furthermore, this occurred without the experimental group increasing the number of questions used, so the change was related to quality rather than quantity of questions. It was also found that the changes occurred without any decrease in subject-centered behaviors on the part of the students. This is an interesting result, given the fears of many educators that the promotion of affective goals will necessarily lead to a decline in cognitive outcomes.

Flanders (1970) has emphasized the need to consider both affective and cognitive components of classroom interaction. He has developed a system whereby interactions may be analyzed in order to understand the processes occurring and help reduce inconsistencies between intentions and actions. The system consists of seven categories of teacher talk, two of student talk and one of silence and confusion. The fourth teacher category is questioning. While not presenting any new questioning scheme of his own, he does highlight certain aspects. First, important questions which are frequently ignored are those relating to attitudes, feelings and perceptions of the students at the moment. He considers also that questions should have a logical developmental sequence and recommends Sander's approach in the cognitive area and that of Taba, Levine and Elzey (1964) for affective questions. The latter involves progression through steps of citing affect, grouping affective states, applying and making conclusions. Although Flander's approach does not represent a unique questioning strategy, it has been included here because it is very influential in teacher training programs.

A variety of questioning strategies has been summarized here. Each has merit, and between them they cover a wide range of possible considerations in relation to questioning. It would be a mistake to consider, however, that any teaching skill could be considered to have been perfected even in theory. The value of such a review as this lies in the juxtaposition of elements which may then be reconsidered and refined and form the basis for the development of new strategies.

Summary.

The centrality of questioning as a strategy used by teachers is clear. It is also apparent that teachers often use questions which are poorly designed and present them in ways which give students little opportunity to respond constructively. Faced with this situation, many educators have designed programs which are aimed at helping teachers to maximize the potential for effective use of questions in the classroom.

There is still room, however, for refinements of existing ideas, for new ideas and new conceptualizations of approaches to questioning. It is the purpose of the next chapter to present the design and rationale for a new approach.

C H A P T E R I I I
QUESTIONING SKILLS FOR INTENTIONAL TEACHING:
A CONCEPTUAL FRAMEWORK

The intentional teacher . . . is an individual who can be in contact with himself and others, can act at will and can allow himself to be acted upon. He has the freedom to fail . . . and to succeed. (Ivey and Rollin, 1974, p.29)

This chapter is based on two assumptions: that questioning is an important teaching activity and that teachers would benefit from training aimed at providing them with an effective questioning strategy.

The theoretical and practical considerations underlying the proposed strategy are presented in the form of four criteria by which aspects of questioning are evaluated. These require that the strategy (1) be compatible with a humanistic approach to education, (2) take into account the developmental stage of the students, (3) be simple enough for novice teachers to learn to use effectively and (4) have general relevance in a variety of teaching situations.

From this base a questioning strategy is elaborated. It begins with the use of open and closed questions, followed by three dimensions of focus and three levels of thinking for which questions can be designed. It also proposes the introduction of a reasonable waiting time after asking a question. Consideration is also given to a method for teaching this strategy. It is emphasized that the desired outcome is not that teachers will apply isolated skills unthinkingly, but that they will have been provided with the means to act intentionally.

Ways of defining questions.

For the sake of clarity it is important to establish the definition of a question to be used in this study. It has been argued by Riegler (1975) that a distinction must be made between the form and the function of a statement. Sentences which are in declarative or imperative form may still function as questions. Examples of such sentences and their suggested equivalents in interrogative form are:

- | | |
|-----------------------------------------------|-----------------|
| I'm not sure that I understand what you mean. | (declarative) |
| What do you mean? | (interrogative) |
| Describe the reproduction of platyhelminthes. | (imperative) |
| How do platyhelminthes reproduce? | (interrogative) |

Sentences may also be in the form of questions but not function interrogatively. A common classroom example would be:

If I make an exception for you, how can I ask everyone else to hand in their work on time?

In the preceding example, most students would recognize the rhetorical nature of the question. Some questions, however, may be functionally ambiguous and lead to communication difficulties. Consider for example the following interchange between a teacher and student:

Why aren't you using the method I taught you on Friday?

Well, I thought about another way and

I suggest you stop wasting time and take notice of what you have been told!

Clearly the first question was not intended to function interrogatively and may be interpreted as:

I want you to use the method I taught you on Friday.

The student, who acted on the basis that the teacher was asking a question may well have experienced difficulty in coping with the angry retort.

The literature on questioning often does not give an explicit definition of what is being regarded as a question. This places limitations on the implications to be drawn from the results of such studies. In studies showing that large numbers of questions are used by teachers, for example, it would be illuminating to know whether rhetorical questions had been counted, and if so what proportion of the total had been of this kind.

Because the issue under consideration is a practical one, questions as they are used in classrooms, it is appropriate that the definition be functional. Hence, for the remainder of this study, a question will be considered to be a statement of any form which is interrogative in its function. Statements which are interrogative in form but not intended to be answered will be designated rhetorical questions. They will not be included in the consideration of "true" questions since in practise their function is different.

The need for a questioning strategy.

A number of recent reviews on questioning (Gall, 1970; Godbold, 1973; Hargie, 1978; Lucking, 1977; Riegle, 1976) have emphasized the importance of looking at strategies rather than isolated questions. Godbold has suggested three aspects for consideration: the number and the sequencing of questions and the pattern of pupil-teacher interactions. Hargie concluded from his review that effectiveness could be increased by using single questions, redirecting them from pupil to pupil and increasing pauses after

asking questions. He also advocated the use of more thought-provoking, probing and oral questions.

Researchers have also drawn attention to the need for questioning strategies. Hunkins (1970) in reporting his research into the different effects of knowledge level and higher order questions concluded that it was inappropriate to use only one kind of question. He suggested that it is necessary to practise to use a planned build up, moving from simple to more complicated.

Taba, Levine and Elzey (1964) have emphasized the importance of the teachers' questioning strategies in their report of a study of the effects of training on the thinking of children.

The role of questions becomes crucial, and the way of asking questions by far the most influential single teaching act. (p.33)
A sequence of questions is needed, such as starting with the "what" or description, following with a "why" or an explanation, and then reaching for a generalization or a principle . . . The chief point about such a strategy of questions is to stimulate and to guide the direction of that search, instead of providing the particular model or even the end product. (p.55)

While different aspects of questioning strategies have been singled out by different writers, all agree that there is an urgent need for teachers to be trained in effective approaches to the use of questions.
Considerations in developing a questioning strategy.

The questioning strategy which will be proposed in this study arises out of the values and beliefs of the writer. It is also circumscribed by expectations regarding the needs and limitations of those who are to learn to use the strategy. These considerations have been organized into four aspects: a humanistic philosophy of education, a structural developmental approach to the understanding of student needs, emphasis on skills which take careful account of student teachers' needs, and preference for those

which are applicable to a wide variety of educational situations.

Humanistic education. This is a term which has been widely and often vaguely used in recent years. With the writings of Maslow, Rogers and others in the fifties, a third force or humanistic psychology began to be recognized. It rapidly gained popularity as seen particularly in the "encounter" movement, and soon moves were being made to "humanize the classroom". The idea of the teacher as a facilitator of learning was proposed by Rogers (1969). Significant or experiential learning in his terms is characterized by personal involvement, self-initiation, pervasiveness, evaluation by the learner and meaningfulness to the learner.

Humanistic education has subsequently become an "umbrella" concept covering a wide variety of beliefs and practises. Some of these have been criticized for encouraging narcissism or anti-intellectualism. Unfortunately, because the term has been so broadly applied, criticism of one extreme aspect has often led to rejection of the whole movement. In order to avoid the tragedy of "throwing the baby out with the bathwater" it is important to give a clear description of the way in which the term as used here is intended to be understood. To this end, the five necessary characteristics of humanistic education proposed by Weinstein (1975) will be used. They are summarized as follows:

- The needs of individuals served by humanistic education are the central data source for decision-making. Of the three areas, society, subject matter and learner, the latter has traditionally been relegated to third place. This position should be reversed.
- Humanistic education increases the options of the learners. This is a

matter of both quantity and quality of choice. The emphasis is upon liberation rather than domestication.

- Personal knowledge gets at least as much priority as public knowledge. Traditionally, subject matter disciplines have dominated the curriculum to the exclusion of knowledge unique to the individual and arising out of his own experience of thoughts, feelings and action.
- Each individual's development is not fostered at the expense of anyone else's development. It is not true that a choice must be made between self-knowledge and social action. The most effective political or social action arises out of personal understanding.
- All elements of the program contribute to a sense of significance, value and worth to each person involved.

The humanistic approach has broadened the scope of education to include catering for the inner needs of the students. One problem with introducing humanistic ideals into classroom practise, however, has been the difficulty of understanding the needs of individuals. Valuable insights into ways of perceiving the world of another person, especially a young student, may be gained from structural theories of development. The four theories to be introduced here are in the areas of cognitive development (Piaget and Inhelder, 1969), moral development (Kohlberg, 1963), self-knowledge (Alschuler, Weinstein, Evans and Tamashiro, 1977) and ego development (Loevinger, 1976).

Developmental theories. The pioneering work of Jean Piaget in the area of cognition has been the inspiration for more recent developmental theories. His approach arose from early experience with traditional intelligence tests during which he concluded that the assumption that children think like adults but less efficiently, was not correct. He noted rather that

childrens' thought had an inner logic and consistency which was qualitatively different from that of adults. His painstaking observations of children led him to postulate four major stages and several substages of development. These are qualitatively distinct, invariant in order, based on an underlying thought organization which is a structural whole, and heirarchical. In the words of Kohlberg and Mayer (1972):

Mature thought emerges through a process of development that is neither direct biological maturation nor direct learning, but rather a reorganization of psychological structures resulting from organism-environment interactions. (p. 457)

The four stages described by Piaget are called sensorimotor, pre-operational, concrete operational and formal operational. Since the transition to concrete operations usually occurs around age six, an understanding of the latter two is most important for elementary and high school teachers. Individuals at both of these stages are capable of complex thought processes. The major difference is that an individual at the concrete operational level is restricted to cognitive manipulation of observable reality, whereas the individual who thinks formally is capable of abstract conceptualization. Such thinking allows for a range of behaviors including systematic hypothesis testing, reflection on the past and speculation about the future.

Some educators advocate that teachers try to encourage early progress from the concrete to formal stage of thinking. Taba et al. (1964) have reported some success in training young elementary school children to think formally. While the possibility and desirability of accelerated progress remain controversial issues, however, there is general agreement as to the importance of teachers recognizing and allowing for different levels in planning and implementing classroom activities.

The other developmental theories which follow are similar to Piaget's in their concern for structural organization rather than content. They also adhere to the concepts of distinct hierarchical stages which occur in invariant order and reflect an underlying structural whole.

Kohlberg's theory of moral development was derived from a study of 72 boys aged 10, 13 and 16 who were interviewed on the subject of several hypothetical moral dilemmas (Kohlberg, 1963). The choices they made were found to be unenlightening, but the reasons for choice and ways of defining the conflict were analyzed into six stages. These were grouped into three levels: premoral, morality of conventional role-conformity and morality of self-accepted moral principles. The first type decreased with age, the second increased to age 13 then stabilized and the third kept increasing to age 16.

At the premoral level, wrong is defined in terms of consequences to the individual whose behavior is being judged. In the first stage this is described by Kohlberg (1963) as reflecting "a realistic-hedonistic desire to avoid punishment, rather than a deep reverence for the adult 'World-Order'" (p.20). This develops into the second stage of naive instrumental hedonism in which the individual's values and needs are recognized with little regard for the rights of others. The level of morality of conventional role-conformity resides in conventional order and expectancies of other people. The "good boy" orientation is revealed by behavior which is conforming and accepting of authority. Some deviation from rules is permitted for the sake of loyalty, the basic orientation being towards gaining approval and liking. This stage develops into an authority-maintaining morality where conforming behavior is motivated by a desire to

avoid censure and resulting guilt. At the third level of self-accepted moral principles, moral value resides in conformity to social principles involving rights and duties, rather than absolute rules. At this level morality is first seen as conforming to laws which are regarded as the product of a democratic process, the stage of "contractual legalistic orientation". The later stage of conscience or principle morality is revealed by an inner compulsion of conscience and a sense of responsibility for ones own actions.

A developmental theory of self-knowledge has been developed by Alschuler et al. (1977) using results of an instrument for eliciting verbal statements describing personal experiences. After analyzing data from this Experience Recall Test for 144 individuals representing a range of ages and social classes, a four stage model of self-knowledge development has been proposed. The four stages are elemental, situational, internal pattern and process.

At the elemental level, events are described in terms of discrete elements without any organization or causal connections being made. In situational thought, single situations are seen as composed of causally connected elements, no connection being made, however, with any other situation. When classes of situations are developed and individuals are able to hypothesize about their responses to such a class, they are at the internal pattern stage. Process self-knowledge involves the development of an ability to verbalize about processes used to control, influence or modify reactions or inner states.

In the past, proponents of humanistic education have tended to say more about what education should achieve than how this can be done. Self-

knowledge theory opens up exciting possibilities for bridging this gap. An understanding of levels of self-knowledge has already been used in a drug education program (Phillips, McLain and Jones, 1977). The course was designed on the assumption that high school students would generally be at a transitional level between situational and patterned self-knowledge. Accordingly, students were encouraged to list situations in which drugs were used, describe their feelings and actions, and begin to develop alternative behaviors in response to patterns they did not like.

Loevinger's theory of ego development to some extent subsumes the areas covered by the preceding theories (Loevinger, 1976). It gives a detailed, rich description of development involving numerous stages. Because it would be impossible to do justice to the theory by a short summary of stages, this will not be attempted here. Instead, an introduction to the concepts involved will be given by way of a description of the four facets of ego development which are considered at each stage. These are impulse control and character development, interpersonal style, conscious preoccupations and cognitive style.

Impulse control is described from the earliest stage of impulsive behavior to fear of being caught, then conformity to self-evaluated standards. To this is added respect for individuality, coping with inner needs and being reconciled to both inner conflicts and the existence of unattainable goals. Interpersonal style refers to issues of dependence and independence, exploitation of others and being helpful in a group, interdependence and individuality. At the highest level, the person is seen to be cherishing individuality while respecting autonomy and interdependence.

Conscious preoccupations relate to bodily feelings and appearance, personal social issues such as acceptability and personal considerations relating to self-respect and self-fulfilment. Cognitive style is described as beginning with confusion then moving from conceptual simplicity through increasingly complex conceptualization, with the added development of objectivity and toleration for ambiguity.

Loevinger (1973) sees her highest or "integrated" stage as similar to Maslow's Self-Actualizing person (Maslow, 1968). She warns, however, that emphasis on the highest level would "miss the spirit of the exposition" (p.26).

Growth does not proceed by a straight line from one low level to another higher level. There are many way stations, and they are all important as stages of life and as illuminations of the conception. In some sense, moreover, there is no highest stage but only an opening to new possibilities. (p.26)

This is an important statement, particularly for anyone planning practical applications of developmental theories. Kohlberg et al. (1972) have also stressed a "healthy" passage through stages rather than accelerated development as a desired aim of education. They have introduced the term "horizontal decalage" to represent exploration within the individual's present level of functioning and suggested that premature development to a higher stage would present problems.

This short summary of developmental theories does not claim to do justice to details of stages within the theories. It was presented to illustrate the central point that individuals at different stages of development have qualitatively distinct thought processes and characteristic ways of viewing the world. Any teacher who has a clear, albeit simplified

understanding of these different stages has a valuable guide for understanding the needs of individual students. When teaching is viewed from this perspective, the best way of helping students to fulfill their needs is to assist in the maximal exploration of their present stage, while giving gentle encouragement to move towards the next higher stage.

Concerns of student teachers. It makes sense to keep any proposed teaching strategy easy to understand and implement. This consideration becomes especially important in relation to the training of student teachers whose experiences in training are often found to be anxiety provoking. Thompson (1963) gave a checklist to 125 student teachers and discovered a high level of anxiety which was significantly higher during the early stages before the teaching practicum had started. From his study he concluded that hearing and imagining about the teaching experience is more anxiety provoking than the experience itself. The level of anxiety of his subjects was reduced after they began working in classrooms. By comparison Fuller (1969) using a combination of counseling interviews and self-reports concluded that in the initial prepracticum phase the anxiety level was low. After teaching began there was a high level of anxiety which in the early stages centered on concerns with the self (such as survival and adequacy) and later focussed on pupil needs. Another study of student teaching stress has been reported by Sorenson and Halpert (1968). They gave a questionnaire to 36 student teachers and analyzed the data in terms of the nature and source of the discomfort. The nature of the discomfort was described as stress, particularly centered on feelings of inadequacy about the teaching role. The sources of discomfort were largely seen to reside in disagreements with the supervising

teacher and perceived differences in personality with the supervising teacher. Problems associated with relationships with students were seen to contribute to both the nature and the sources of the discomfort.

At first sight, these research findings appear to be conflicting, yet differences may be attributed to different structuring of training programs. The difference in anxiety at the prepracticum stage between subjects in Thompson's study and those in Fuller's study may reflect different opportunities to interact with students who are already teaching.

Fuller and Bown (1975) have described the process of becoming a teacher, based on their own research and that of others. They have elaborated a four stage sequence of concerns which they see as typical of this process. The following is a summary of these stages:

- Preteaching concerns. Students are still identifying with the school pupil role and tend to be unsympathetic critics of the teachers they are observing.
- Early survival concerns. These relate to class control, mastery of content and evaluation of supervisors. Often students wonder if they can ever learn to teach, and most experience high levels of stress. Feelings of inadequacy may be increased by being asked to teach in a way that is unfamiliar.
- Teaching situation concerns. These still revolve around survival as a teacher, but also include limitations and frustrations in the teaching situation. More attention is now given to methods and materials.
- Concerns about pupils. Students report experiencing such concerns throughout their training program, but often they have to set aside these concerns until they have dealt with their survival needs.

The weight of evidence for the anxiety provoking nature of student teaching places a great responsibility on teacher educators to plan programs which take this into account. No matter how theoretically sound a teaching procedure is, if the students are not ready to receive and use it, at best it will fall on deaf ears, at worst it will increase the already high level of stress. Thompson (1963) has stated this very clearly:

Inasmuch as anxiety has the effect of reducing mental efficiency and classroom performance, it is to the advantage of all concerned - student, faculty member and supervising teacher alike - to become aware of the problem and to try to coordinate their efforts in the direction of reducing the amount of anxiety experienced by students in their teacher preparation program. (p. 439)

General relevance. A teaching strategy which can be applied to different ages, classroom environments and curriculum content is one way of reducing the feeling of overload experienced by student teachers. If an approach is modifiable to fit many situations it should be more accessible to use than a variety of situation-specific techniques. An additional advantage relates to the possibility of moving across traditional barriers which have existed between formal levels (junior - senior, elementary - high) and between subject matter areas. A teacher may, for instance, have been trained in the "discovery method" for teaching science and view himself/herself solely as a teacher of this subject by this method at a particular level. A more broadly based approach should enable the teacher to attend to, and cater for, a wider range of needs and levels of development and avoid compartmentalization of experience. This is not to say that specific techniques are not required for particular aspects of learning as advocated by Gall (1970). It seems reasonable, however, on both logical and practical grounds to give precedence to "general purpose" approaches in the initial training of teachers.

A proposed questioning strategy.

This section presents an approach to questioning which expands the kinds of questions usually asked in classrooms and delineates improved methods for their use.

Open and closed questions. The dimensions labelled open and closed questions and focus are based on similar dimensions in the Ivey taxonomy (Ivey, 1971; Ivey and Authier, 1978). This taxonomy forms a basis for the microcounseling approach to communication training which has been described in Chapter II. As already explicated, microcounseling has been demonstrated to be useful in a variety of communication situations including teaching. Because it was originally based on counselor training it fits well with an approach to education which emphasizes individual development and needs.

Open questions are worded in such a way that they encourage consideration of a variety of possibilities whereas closed questions usually require a response which is selected from a limited range. Answers to open questions would be expected to be longer and more elaborate than answers to closed questions. The latter can often be answered with a simple "yes" or "no" or statement of fact. Open questions typically begin with "what", "how", "why", or "could". Although this generalization is useful, it should not be rigidly applied. Exceptions are easily found such as the closed question "What is your name?".

Although the open - closed dimension has not been used to analyze studies of teacher questions, the finding from such studies that most questions only ask for facts, suggests a predominance of closed questions.

In presenting the concepts of open and closed questions it is not intended to advocate the use of one as "better" than the other. Rather, consideration should be given to the appropriate use of each. Closed questions, for example, provide efficient means for obtaining information and for focussing a discussion which has become too diffuse. Open questions, on the other hand, would be expected to give more freedom for student initiative and the use of complicated thought processes. They represent a useful skill for teachers who wish to develop more "student centered" approaches in their classrooms.

Focus. In its original counseling context, the concept of focus related to selective attention to certain topics (Ivey, 1978). The simple but often overlooked observation was made that what the counselor chooses to attend to will strongly influence what the client talks about. Examination of tapes of interviews revealed that counselors often focussed on content such as other people and outside situations to the exclusion of the client's immediate experience.

In applying this concept to classroom questions, three broad areas of focus will be considered. These are personal, interpersonal and public, as defined by Newberg and Levin (1972). Questions having personal focus would seek to enable the student to "learn about himself as a person - his strengths, his vulnerabilities and his abilities, while grappling with establishing his identity" (p. 4). Interpersonal focus is directed towards learning "in a community of peers about himself in relation to others, how individuals in a group interact with each other, and how one negotiates between being an individual and part of a whole" (p. 4). Public focus is on the traditional areas of school subject matter.

By considering these three areas of focus, student teachers will develop the capacity to introduce a much broader range of material into the classroom than is usually present. It should be emphasized that the delineation of these areas is for convenience. It is not intended that they be rigidly separated and develop into a new form of compartmentalized knowledge. On the contrary, teachers should aim at integrating these areas. For example, a discussion of energy problems (public focus) will be much more meaningful if it involves students' feelings when considering possible future changes (personal focus) and attitudes towards fair distribution of scarce resources (interpersonal focus).

If done sensitively, the introduction of personal and interpersonal focus into classrooms would be a major step towards achieving humanistic objectives. It is recognized however, that this is not just a simple matter of introducing new "topics". Public knowledge is generally easier to discuss and less personally threatening than personal and interpersonal knowledge. It would be irresponsible to train teachers to ask questions in the latter areas without the concomitant introduction of safeguards such as the students' rights to privacy and their rights to know the reasons for such questions being asked. Strategies for dealing with these aspects may be found in books which are specifically directed towards value clarification and affective education (Casteel and Stahl, 1975; Eberle and Hall, 1979; Williams, 1970). One example is to have students write answers to personal questions, then give them a clear mandate to decide whether or not to share the answer.

Two further aspects of a questioning strategy will be discussed. These refer to the level of thinking required by the question and the time the teacher is prepared to wait after asking a question.

Level. Taba et al. (1964) have pointed out that the concept of level can refer to both the psychological and logical level of thought. Bloom's taxonomy of educational objectives (Bloom, 1956) provides an example of logical levels. Psychological levels are illustrated by the models already presented in the realms of ego, moral, cognitive and self-knowledge development. It is possible to design approaches to questioning tailored to fit any one of these models as has been done by Ziff in the area of self-knowledge (Ziff, 1970). To attempt to design questions for each level in all areas however, would be very complex and certainly add markedly to the student teachers' anxieties. For this reason, this aspect of the strategy has proved to be the most difficult to design. The easiest solution would be to ignore the concept of level. However, the many studies demonstrating the generally low level of teachers' questions make this issue too important to set aside.

Taking all of the preceding into consideration, it has been decided to categorize questions at three levels: information, generalization and expansion, according to what they are asking of the students. It is interesting to note that this approach fits with a rule of thumb already used by some classroom teachers to proceed from "what?" to "so what?" to "now what?". Information questions involve asking students to tell what they know by way of experience, whether through reading, hearing, being somewhere or feeling something. Generalization questions require that the material gathered from information seeking questions be connected in some way so that general rules may be developed. Expansion questions broaden the scope of thinking by asking for imagination and creativity, for speculation about possible changes to patterns and for making value judgements.

The following table gives an example of each of these levels of question for each of the three areas of focus.

TABLE 1
Examples of Questions from Each Level and Each Area of Focus

FOCUS	LEVEL		
	Information	Generalization	Expansion
Private	What were you doing the last time you felt very happy?	What kinds of things (experiences) always make you happy?	If you could do anything you like for a year, what would you choose?
Inter-personal	What was one thing you found helpful about working in pairs?	Do you work better on your own, with a small group or with a large group?	How could our class be redesigned so that everyone could work in their own style as far as possible?
Public	What is the capital of Victoria?	From what you know about Australian cities, what must the spread of population be like?	If you were part of the Australian Government, how would you try to bring about decentralization?

Although the levels are not designed specifically for any one model of development, they are compatible with each of them. In the area of self-knowledge, for example, at the elemental level information questions would be most appropriate. Generalization questions could be used more in the situational and pattern levels, with the connections asked for at the situational level being simpler and more concrete than those at the pattern level. At the process level there would be much more scope for expansion questions in addition to the other two. Similarly, when related to Bloom's taxonomy of objectives in the cognitive domain, the new categories although intended to cover more than the cognitive area, are still compatible. Bloom's knowledge category is similar to information, his comprehension, analysis, synthesis and some aspects of application could be labelled generalization, and his qualitative aspects of evaluation could be considered to be expansion.

It is not intended however, to limit the level of questions to specific developmental levels. Bruner (1963) has stated:

If one respects the ways of thought of the growing child, if one is courteous enough to translate materials into his logical form and challenging enough to tempt him to advance, then it is possible to introduce him at an early age to the ideas and styles that in later life make an educated man [sic]. (p. 52)

Rest (1974) in reviewing applications of Kohlberg's theory to education has advocated presenting children with stimuli at one level above their present level, while Taba et al. (1964) have concluded from their research that children can be taught to think formally at a very early age.

In order to translate these ideas into practise, a teacher should have some knowledge of the various developmental models and an understanding of the implications of these models for individuals in the classroom.

Questions may then be designed which seek to provide sufficient challenge to encourage movement without being out of reach and hence discouraging. Hunt (1978) has described these processes in terms of "reading" (being sensitized to the student) and "flexing" (modulating to perceived student frame of reference). These seem to be the key elements in asking questions at different levels. For an experienced teacher, the reading and flexing processes will probably take into account much more detail from the situation than the student teacher is capable of perceiving or understanding. This should not prevent teacher educators from encouraging their students to try to use these two processes in ways which are manageable for them. It is hoped that the three category approach to level as outlined will provide a conceptual basis for doing this.

Wait time. The idea of pausing after asking a question to give the respondent time to consider a reply seems to be a matter of common sense. Yet it has been shown by Rowe (1978) that teachers often do not do so. Analysis of tapes of elementary science teachers from the United States revealed that a teacher typically waited less than one second after asking a question for a student to begin to answer. If this did not happen the teacher repeated, rephrased or called on someone else. Rowe observed that not only did this cause teachers to work very hard (some asked as many as twelve questions in a minute) but the children showed increased breathing and sighing rates as the number of questions increased.

Following these observations, Rowe (1978) worked with a group of fifty elementary science teachers who agreed to try to extend their wait time to three seconds or more. The result was an impressive array of changes

summarized as follows:

- The length of student responses increased by between 300 and 700 percent.
- The number of unsolicited but appropriate responses by students increased.
- The number of failures to respond decreased dramatically.
- Confidence, measured by non verbal indicators, increased.
- The incidence of speculative thinking increased.
- Teacher centered behavior decreased and child to child comparing increased.
- The number of times children made inferences and supported them with evidence increased.
- The incidence of enquiry from children increased.
- Contributions from children formerly regarded as "slow learners" increased.
- The number of disciplinary moves decreased dramatically.
- The teachers also changed. They asked fewer questions but these were more variable and showed greater response flexibility. Their expectations for performance of certain children also seemed to change.

It is astonishing that so much change could occur as a result of pausing longer after asking a question. While not underestimating the difficulty student teachers may have with waiting (silence can be very threatening) this seems to be an aspect of a questioning strategy which is simple to understand and clearly linked with humanistic outcomes.

This completes the outline of the proposed questioning strategy. The strategy as a whole and each single skill have been selected to fit the criteria previously established. The connections between the strategy and the criteria will now be made more explicit.

The concept which most clearly contributes to a humanistic view of education is that of focus. By defining the areas of knowledge as personal, interpersonal and public, the teacher is being encouraged to recognize the former two areas which in a humanistic framework must take precedence over the public area. Thus the concept of focus provides a structure within which a person who has chosen a humanistic view of education may operate. The use of open questions allows individuals to explore their own feelings, relationships and creative ideas so helps to keep the emphasis on the world of the learner and move away from the assumption of one right answer to every question. Asking questions at different levels is one way of recognizing the needs of individuals and attempting to cater for them, rather than settling for the "lowest common denominator" of the group. Waiting a reasonable time for a reply is an indication of respect and caring from the teacher to the students.

A recognition of developmental theories is implicit in the concept of level. Around this framework refinements can be developed as the trainee teacher progresses both in expertise and understanding of the developmental theories. For example, high school teachers should learn to begin all discussions around specific, observable events rather than abstractions. This is based on the assumption that their students would mainly be operating at the concrete cognitive stage and the situational level of self-knowledge. Next, they should learn to cater for those at the formal operational stage and pattern level without neglecting those at the previous stages. This requires a constant interplay of reading and flexing.

The needs of student teachers have been kept in mind throughout the planning of this strategy. Those who are experiencing early survival concerns may not be ready to try all the skills since they need to stay on familiar ground. One advantage of this strategy is that each skill is effective on its own. Student teachers with survival concerns need to be able to make small changes in their behavior and experience the results of these changes in order to see themselves as learning to teach. Increasing waiting time after asking a question would be a good skill to start with for this reason. For those who have teaching situation concerns, the other skills provide a framework around which questions can be planned. The strategy also gives priority to the needs of pupils and clear practical guidelines for dealing with these. In this way it assists the many student teachers who express concern for their pupils, but find difficulty putting this into practice. The decision to use a microtraining approach to teach this strategy also serves the needs of the student teachers. This will be elaborated in the following section.

This strategy is versatile and flexible enough to be used in most teaching situations. The skills could be used with individuals and groups of varying sizes. They are also appropriate for a wide range of ages. Apart from the concept of level which may need modification for preschool children, there is no reason why the skills can not be used effectively with people whose ages range from very young to adult. The strategy is also suitable for use with different areas of subject matter both traditional and non traditional.

It is not claimed that this model covers all there is to know about questioning and decisions about what to include must to some extent be

arbitrary. It is claimed, however, that the thoughtful use of any of these aspects of questioning would lead to improvement in the quality of classroom interactions. Furthermore, any teacher who could use all of them consistently and appropriately would be extraordinarily effective. A suggested approach to the teaching of this strategy.

Microteaching is a training model for teachers which was developed by Allen and his colleagues at Stamford University in 1963. (Allen and Ryan, 1969). It has been used in over half of the teacher training programs in the United States and in many other parts of the world (Turney, Clift, Dunkin and Traill, 1973). The format involves first an instructor teaching a single skill to a small group of students for five to 25 minutes. Next, the trainee teaches a five to ten minute lesson to a small group of students, then together with a supervisor analyzes a videotape of the lesson. The trainee then reteaches a refined version of the lesson to another group of students. The microcounseling approach of Ivey (1971) and subsequent microtraining courses have used a basically similar format while greatly extending the skills taught. Since the questioning skills to be taught have already been described, the focus of this section will be on microtraining as a procedure without regard to content.

In an early article outlining the rationale for microteaching, Allen and Clark (1967) made the following points based on the perceived needs of student teachers. Students gain their experience in a real situation, but one that is low risk compared with a normal school class. The approach is consistent with learning theory by providing numerous distributed practise sessions, immediate feedback and low threat. It can accommodate a wide

range of student abilities and variety of teaching skills. In addition, it is a method which is economical in terms of both time and resources.

Reviews of research relating to microteaching (Hargie, 1977; Sadker and Cooper, 1972) and the effectiveness of teacher education (Mackey, Glenn and Lewis, 1977; Peck and Tucker, 1973) reveal a large number of studies with the weight of evidence in favour of this approach. Measures of success have generally been in two areas, actual teaching performance and effects on the pupils taught by the student teachers. A small number of representative studies in these areas will be briefly described.

Jensen and Young (1972) conducted a study of students who had been trained by microteaching procedures. They evaluated teaching performance on three occasions during student teaching experience. Their results showed high ratings in desirable personality traits, warmth of teacher behavior, general classroom atmosphere, lesson usefulness and teacher interest in pupils. Sanders, Neilson, Gall and Smith (1975) evaluated four methods of training preservice teachers in questioning skills. One group received regular microteaching, another received microteaching with the use of peers as students. A third group had videotape and handbook instruction with classroom observation, while a fourth had lecture-discussion presentations. Both microteaching groups were found to have made substantial and consistent gains in questioning skills, significantly beyond those of the other groups. There was no substantial difference between the two microteaching groups. A study by Copeland (1975) of classroom performances of 32 student teachers following microteaching found that the training effects were not carried over. He suggested the possibility of strong intervening effects from supervisors, pupils and the student teachers' perceptions of their roles

as teachers. While these effects may vary according to the general organization of the training program, the possibility of such negative interference should be kept in mind. A suggestion by Peterson (1973) of a "refresher" microteaching experience during student teaching is one possible way of bridging the gap.

The microteaching experience tends to elicit favourable responses from the student teachers involved. A description of student responses to a training program developed by Hatton and Owens (1977) reported increases in self-awareness, appreciation of students' own unique characteristics, self-confidence and autonomy. The students also felt that the teaching segments devised in response to self-criticism and peer evaluation were successful.

Effects on pupils have been studied less than other aspects of microteaching. There also seem to be more studies which have not found significant results. Pierce and Halinski (1974) used an achievement test to measure pupil outcomes. They found no difference in achievement between pupils taught by microteaching students and those taught by other student teachers. In discussing their findings the authors pointed out that the small numbers involved made a Type II error likely. They also felt that the limited time for lessons did not allow the pupils to internalize the learning. This seems to be a common problem with such studies. Since microteaching trainees are typically trying to foster critical thinking in their pupils it seems unrealistic to expect any test to measure differences in this area after a few short lessons.

There are other desirable outcomes such as pupil initiative which should be more amenable to study. In one such study Wraggs (1971) compared student teachers who were trained by using both videotape feedback and information about their interactions with the class, with groups having only one form of feedback. He found that the former group were likely to lecture less, elicit more spontaneous talk by their pupils and be rated higher by them.

After reviewing twenty recent studies on microteaching, Hargie (1977) concluded with these observations:

A programme of MT should be an important element in any teacher training course . . . it is a more useful technique than the 'traditional' method of practice teaching. At the same time it should be noted that a programme of MT is intended to complement the teacher training course, and is not intended as a complete replacement for traditional teaching practice. (pp. 94-5)

The desired outcome.

While the emphasis throughout this paper has been on a questioning strategy for teachers, this is not intended to indicate a desire to increase the number of questions asked or the importance of questioning by teachers. Indeed, questioning may be overworked in many classrooms because teachers lack a repertoire of other communication skills. In a broader context, then, it may be desirable for teachers to be trained in other forms of response and learn to ask fewer questions. This does not however, decrease the importance of teachers being trained in more effective uses of questioning.

It is also important that the skills which are part of the suggested questioning strategy not be viewed in isolation regardless of context and interrelationship. Periera and Guelcher (1970) have objected to micro-

teaching on the grounds that it takes a doctrinaire view of skills and ignores the relationships between them. The dynamic approach they advocate emphasizes not just behavior, but behavior with a purpose:

Instead of seeing the skills as only behavior, they are regarded as behavior in a context with a purpose, in view of what has preceded it and in anticipation of what may follow it. (p. 14)

The question of conflict between "overly behavioristic" skills approaches and humanistic approaches has been addressed by Bradley (1975, 1977). He has argued that the construct of intentionality provides a means whereby these two approaches can be reconciled and used to maximum effect in teacher training programs. This construct has been defined by Ivey and Rollin (1974) as follows:

The intentional teacher is one who has many behavioral options open to him, can decide which option seems appropriate, and can interact with environmental feedback to change the directions of his actions. (p. 21)

Viewed in this context, the purpose of teaching a variety of questioning skills is to provide the teacher with new behavioral options. Decisions regarding appropriateness must be largely subjective based on the teacher's own beliefs and attitudes. The latter will be influenced by a variety of training experiences. In teaching the concept of focus, for example, a humanistic view of education will be presented.

Summary.

In this chapter, a questioning strategy for classroom teachers has been developed. In so doing, consideration has been given to humanistic approaches to education and structural theories in the areas of cognitive, moral, ego and self-knowledge development. Concerns of student teachers have also been explicitly taken into account.

The proposed questioning strategy arising out of these considerations requires that questions be categorized according to focus and level and whether they are open or closed. It also involves presenting "wait time" as an important aspect of questioning. The microtraining paradigm has been proposed as the method of choice for training teachers in the use of this strategy.

Despite the emphasis on skills training in this chapter it is not intended that teachers learn merely to use isolated skills. The desired outcome has been described as a teacher using this increased behavioral repertoire "freely and spontaneously - with intentionality" (Ivey and Rollin, 1974, p. 21).

CHAPTER IV

METHOD

The study involved an investigation of the effects of training pre-service teachers in a questioning strategy. The major issue addressed by this study was:

Will teachers who are trained in a questioning strategy acquire and use particular skills?

An additional issue addressed by the study was:

Will the students taught by teachers trained in this questioning strategy change their verbal response patterns?

Subjects and setting.

This study was conducted in a teachers' college in Melbourne, Australia. The subjects were undergraduates in the final year of a four year Bachelor of Education course. All were training to become secondary school teachers in a variety of subject areas. The experimental group numbered 19 and the control group 11 subjects. Both groups were enrolled in separate but parallel streams of an educational psychology unit. The unit lasted for ten weeks and classes were conducted for two hours a week. Both classes were taught by the experimenter. During this ten week period, subjects spent two days of each week teaching in high schools and three days doing course work at the college.

Procedure.

Training workshops. Questioning skills workshops were conducted during the three two-hour classes occurring in weeks four, five and seven of the course. Materials given to the students are included as Appendix A.

A summary of the form and content of each class follows.

In the first workshop, the goals for the three classes were introduced. Since the experience of being trained in specific skills would be new to many students they were given a handout entitled "Training in skills suitable for teaching" which was to serve as an introduction. It was emphasized that while the training was to be in specific skills, the ultimate goal was for these to be used with intentionality. This led to the concept of a questioning strategy which may be adapted to the specific learners, teacher and the learning environment.

The concepts of open and closed questions were introduced and practised during this class. Short definitions and examples were given. Each member of the group then prepared and tried out examples of both types of question. Group discussion centred on the effects of using these skills, and subjects were invited to write brief notes as reminders of points raised during the discussion. This was followed by microtraining practise in groups of three, with members taking turns to take the role of teacher, student and observer - recorder. Subjects were asked to bring examples of open and closed questions to the next class.

The second class began with a short period of interaction between pairs of students using their prepared questions. This was followed by an explanation of the concept of wait time accompanied by prepared notes. The whole group then participated in a question asking activity which required that there be a wait time of at least three seconds. Subjects were invited to monitor and share their thoughts and feelings throughout this process. The class was concluded with microtraining as before, and homework was set for the following week.

In the third class the concept of focus was introduced using the same basic format of introduction, group discussion, practice, microtraining and homework. The format for this class is presented in detail in Appendix A.

In parallel with the three classes first described, the control group received training in the application of assertiveness skills to classroom interactions.

Design considerations. The research design was a modified version of a quasi-experimental research model described by Cook and Campbell (1976) as "the untreated control group design with pretest and posttest". The modification in this study consisted of the addition of a second posttest measure three months after the training program.

Careful consideration was given to issues relating to the internal validity of the research and some discussion of these issues seems appropriate at this point.

If students from the experimental group had discussed their classes with students from the control group, "diffusion of the treatment" (Cook and Campbell, 1976, p.228) could have occurred. The likelihood of this happening was reduced by choosing the two groups from populations which took college classes on different days of the week, thus minimizing contact.

Validity may also have been affected by "resentful demoralization" of participants in the control group (Cook and Campbell, p.229). This was successfully averted by not informing subjects as to which group was the control group. It was also noted that the skills training provided for the control group met with a very favorable response.

The "interaction of procedure and treatment" was another possible threat to validity. This has been described by Cook and Campbell (1976) as follows:

Sometimes the respondents in the treatment and control groups will learn new information or undergo new experiences as part of the context in which treatments are embedded, and this may influence how treatments are reacted to. (p. 244)

Since all subjects were undergoing new experiences as part of their teacher training programs, some of these could have affected the results. It was impossible to control for this effect. It was determined that no subject was engaged in any other course specifically designed to teach questioning skills during the experimental period. However aspects of questioning may well have been discussed with other lecturers and supervising teachers.

Data collection. The data collection occurred in weeks two and three of the course, weeks seven and eight and three months later. Initially, all subjects were asked to prepare half-hour audio tapes of a class they were teaching. They were told that the tapes were to be used to study classroom interaction, with no mention of the research interest in questioning strategies. They were then asked to select from the tape a ten minute period involving a high degree of verbal interaction and to make a transcript. This procedure was repeated in weeks seven and eight, and three months later.

For the transcript of the second tape, experimental subjects were requested to analyze all questions as open or closed, decide on the focus and measure wait time. Control group subjects were to analyze their transcript in terms of assertion skills. Details of assignments may be found in Appendix B.

Rating procedures. Three raters were hired and trained in the rating procedure. This involved explanations both verbal and written of the concepts involved, and several hours of practice in rating statements. The raters then categorized each teacher statement as either an interrogative question, rhetorical question or not a question. Those statements which were judged by two or three raters to be interrogative questions were categorized as open or closed, then assigned to one of three categories of focus and of level. Following this, ratings were compiled and final categories assigned on the basis of two or three raters agreeing.

A record was kept of all rater disagreements, and from this indices of reliability were calculated. These were in the form of percentage agreement for all data and for each category of question separately. The extent to which each rater contributed to the total disagreement was also calculated as a percentage.

Wait times, teacher talk times and student talk times were also measured. This was done using the original student tapes, recorders and stop watches. In the case of wait times, the playback was slowed to half speed to reduce errors of measurement.

Dependent variables.

Interrogative and rhetorical questions. Interrogative questions are those statements in which the wording and context indicate that they require an answer. In this respect, function rather than form is the deciding factor. For example, "I don't understand what you mean" would generally be classified in the same way as "Would you explain what you mean?". Rhetorical questions are those statements which are written in the form of a question but for which the context indicates that no answer is required.

"Would you care to sit down" is an example of a rhetorical question. In the remainder of this chapter, "question" will refer only to interrogative questions unless stated otherwise.

Open and closed questions. An open question allows the respondent to select from a range of possible responses. There is freedom to develop the answer at length and in detail, and no single answer will be necessarily regarded as correct. A closed question allows for only a narrow range of alternative answers. The answer given is usually short and may be judged right or wrong, true or false. Examples of a closed and an open question seeking for similar information are, respectively: "Do you like mathematics?" and "How do you feel about mathematics?".

Focus. The focus of a question is the content domain to which the student's attention is being directed. The three categories to be used are those which Newberg and Levin (1972) have labelled personal, interpersonal and public knowledge. Questions directed to the student as a person, his or her feelings, values, strengths, vulnerabilities or ambitions will be categorized as personal in their focus. Questions which direct attention to peer relations, how individuals in a group interact or how one negotiates between being an individual and part of a whole will be categorized as interpersonal in focus. Questions directed towards the usual areas of school subject matter will be categorized as public in their focus. Questions will generally be categorized according to their major focus but it may be necessary to use more than one category for some questions. For example: "How do you react if you discover that your friend has told on you to a teacher?" could be classified as both personal and interpersonal since

the student could respond either by describing his or her own feelings, or interactions with the friend.

Level. Questions are classified at different levels according to the mode of thinking required to produce a matching response. The first level is information which requires that the respondent state facts drawn from any area of knowledge. The second level, generalization, requires the elaboration of connections, patterns, hypotheses or principles concerning categories of facts. The third level, expansion, may involve any one of a number of ways of extending thought processes, for example, by making predictions, seeking alternatives and taking a creative approach to a problem.

Wait time. This is a measure of the time elapsed between the end of a teacher's question and the commencement of the next verbalization. The wait time may be terminated by a reply from a student, the teacher rephrasing or redirecting the question, asking a new question or calling on a particular student to answer.

Student and teacher talk times. These are measures of the total time occupied by student verbalizations and the total time of teacher verbalizations during each tape.

Data analysis.

Comparisons were made between measures paired as follows:

- (1) pretest experimental, pretest control
- (2) first posttest experimental, first posttest control
- (3) second posttest experimental, second posttest control
- (4) pretest experimental, first posttest experimental
- (5) pretest experimental, second posttest experimental.

Since the data was in the form of proportions the test for the difference of two proportions was used. (Hoel, 1971). This test was applied separately to each of the three categories of teacher statements and eight categories of questions described in the section headed "dependent variables".

Hypotheses.

The following null hypotheses were tested in order to investigate the two questions addressed by this research and presented at the beginning of this chapter. In each case the hypothesis refers to effects on the dependent measures taken immediately and three months after the training procedure.

- $H_0(1)$ There will be no difference between the experimental and control groups in the proportion of rhetorical and interrogative questions asked by teachers.
- $H_0(2)$ There will be no difference between the experimental and control groups in the proportion of open and closed questions asked by teachers.
- $H_0(3)$ There will be no difference between the experimental and control groups in the proportion of teachers' questions which focus on the areas of personal, interpersonal and public knowledge.
- $H_0(4)$ There will be no difference between the experimental and control groups in the proportion of teachers' questions at the levels of information, generalization and expansion.
- $H_0(5)$ There will be no difference between the experimental and control groups in the average number of seconds in the wait time following a question asked by a teacher.

$H_0(6)$ There will be no difference between the experimental and control groups in the percentage of teacher talk time.

$H_0(7)$ There will be no difference between students taught by teachers from the experimental and control groups in the percentage of student talk time.

C H A P T E R V

RESULTS

The two purposes of this study, as introduced in Chapter I were to:

- (1) develop a questioning strategy which teachers may use to increase classroom effectiveness, and
- (2) investigate the acquisition of these questioning skills by student teachers.

The questioning strategy which was introduced in Chapter III is composed of a number of skills which were selected to fulfil certain criteria. For this reason, the first section of this chapter will present descriptive data relating to the use of these skills. Results of the investigation into the acquisition of these skills will then be presented.

Dependent measures: descriptive data.

The mean proportions for both groups (experimental and control) at each stage (pretest, posttest and second posttest) are presented in Table 2. The proportion of questions in each category was first calculated for each person, then the mean of all proportions within each group was determined. It was considered desirable to use that procedure in order to give each subject equal weighting, since the numbers of questions asked by individuals varied greatly ($\bar{X} = 33.2$, $S = 23.83$). For student talk time the total time during which students were talking was expressed as a proportion of the total talk time for both students and teachers, for each subject.

It is clear from Table 2 that questions with interpersonal focus and those at the expansion level were extremely rare. Also rare were open questions and those at the level of generalization. In fact there was an overwhelming predominance of closed questions with public focus which required only recall of information. These constituted over 75 percent of the 1203 questions asked.

These results demonstrate that the student teachers in this study had similar questioning patterns to those reported in many other studies and summarized by Godbold (1973).

The strongest generalization to come out of the research on teacher questioning is that teachers ask a large number of questions and the greatest portion of these elicit responses which represent simple recall of information. (p.3)

The reliability of the raters is indicated by consideration of agreement between the sets of observations. The agreement taken across all classes was found to be 85 percent. For individual classes, see Table 3.

Test for the difference of two proportions.

In order to compare the two proportions, a suitable test is the test of the difference of two proportions proposed by Hoel (1971) which is based on the following theorem:

When the number of trials n_1 and n_2 are sufficiently large, the difference of the sample proportions $\hat{p}_1 - \hat{p}_2$ will be approximately normally distributed with mean $\mu_{\hat{p}_1 - \hat{p}_2} = p_1 - p_2$ and variance $\sigma^2_{\hat{p}_1 - \hat{p}_2} = p_1 q_1 / n_1 + p_2 q_2 / n_2$. (p.135)

Under the null hypothesis, $p_1 - p_2 = 0$ and using this theorem, the following formula for a standard normal score is derived:

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sigma_{\hat{p}_1 - \hat{p}_2}}$$

In calculating $\sigma_{\hat{p}_1 - \hat{p}_2}$, $q_1 = 1 - p_1$ and $q_2 = 1 - p_2$ and p_1 and p_2 are both estimated by p , the pooled proportion of successes.

Table 2

Mean Proportions for Eight Categories of Question and Student Talk Time

[illegible]

This test of the difference of two proportions was used to compare measures for five combinations of groups and stages:

- experimental pretest and control pretest
- experimental posttest and control posttest
- experimental second posttest and control second posttest
- experimental pretest and experimental posttest
- experimental pretest and experimental second posttest.

In each case the test was used for rhetorical and interrogative questions, the eight categories of questions and for student and teacher talk time. Although the concept of level was not taught in workshops due to time constraints, it was included in the ratings on the assumption that a change such as increased numbers of open questions may also change the level of questioning. The Z value did not reach the required value of 1.96 for significance at the .05 level in any of these tests. For this reason the null hypotheses $H_{o(1)}$, $H_{o(2)}$, $H_{o(3)}$, $H_{o(4)}$, $H_{o(6)}$ and $H_{o(7)}$ introduced in Chapter IV were not rejected.

Wait time.

For each subject the wait time following each question was measured and the mean obtained. These were used to calculate the mean and standard deviation for each group at each stage of the study. These values are presented in Table 4 and graphed in Figure 1. The means were compared using a t test and the same five comparisons as used for the difference of proportions. T values are given in Table 5. Significant differences were found between the experimental and control groups at the pretest stage ($p < .05$) and between the performances of the experimental group at the pretest and second posttest stage ($p < .01$). The difference between the

Table 3
Percentage of Rater Agreements
Within Each Statement Class

Statement ^a	Open - Closed	Focus	Level
86	87	79	85

^a'Statement' refers to the categories of interrogative question, rhetorical question or not a question.

Table 4
Mean and Standard Deviation of Wait Times (in Seconds)
For Each Group

	<u>Experimental</u>			<u>Control</u>		
	Pretest	Posttest	Second Posttest	Pretest	Posttest	Second Posttest
\bar{X}	1.012	1.233	2.101	1.404	1.252	1.156
S	0.424	0.761	1.390	0.647	0.662	0.514
N	12	14	6	9	10	6

experimental and control groups at the second posttest stage closely approached the .05 level of significance. For the comparison between results for the pretest experimental and control groups, a two-tailed test was used since the direction of the difference was not predictable. For the others, a one-tailed test was used since the experimental treatment was designed to increase the measures of the variables concerned.

Cook and Campbell (1976) have stated that there are five different empirical outcomes obtainable from studies using an untreated control group design with pretest and posttest. The outcome for wait time in this study having differences between means in opposite directions at the pretest and second posttest is of the most unequivocally interpretable type. Although the difference for the posttest means is only significant at the .1 level, the highly significant change ($p < .01$) between the experimental group means at the two stages strengthens this argument.

The important point concerns the pattern of switching mean differences, for this tells us that the low scoring pretest group (the "experimentals") has overtaken the high scoring control group. (p.253)

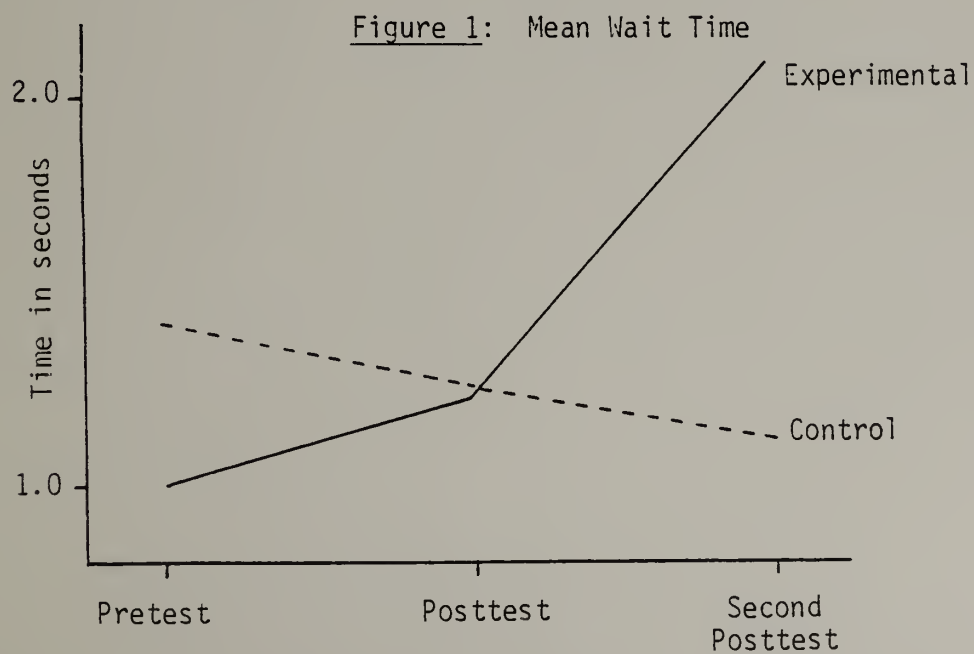
Cook and Campbell (1976) also give several other reasons why this result is more interpretable than others. Arguments for alternative scaling are negated since the interaction would remain despite a transformation. The existence of the crossover also counteracts any argument for a "ceiling" effect. It is possible that the amount of change was inflated by a low beginning point, but this is seen by Cook and Campbell to be the exacerbation of a true effect rather than artifact.

It has been argued by Bracht and Glass (1968) that such an interaction pattern gives a strong basis for causal inferences. The issue of causality

Table 5
Comparison of Mean Wait Times Across Groups

	t	df
Experimental Pretest - Control Pretest	-2.11**	19
Experimental Posttest - Control Posttest	-0.06	22
Experimental Second Posttest - Control Second Posttest	1.65*	10
Experimental Pretest - Experimental Posttest	-0.90	24
Experimental Pretest - Experimental Second Posttest	-2.68***	16

*	p .1	(one tailed)
**	p .05	(two tailed)
***	p .01	(one tailed)



will be taken up in Chapter VI.

Summary.

The results presented in this chapter furnish strong support for previous studies which have indicated that teachers ask questions at a rapid rate and generally require only recall of information.

In this study it was found that student teachers from the experimental group who were trained to increase wait times did so, while those in the untreated control group decreased their wait times. A suggested explanation for this result will be presented in Chapter VI. A test of the difference between proportions was used to compare the other variables across groups and stages with no significant differences being obtained.

CHAPTER VI

DISCUSSION

This chapter uses an approach which parallels the presentation of results in Chapter V. Firstly, aspects of the skills which constitute the questioning strategy are discussed in the light of research findings. This is followed by a discussion of the results relating to the effects of the experimental treatment. The final section deals with suggestions for modified procedures and other avenues of further research.

The questioning skills.

Consideration of rater reliability throws some light on the categories of questions involved in this study. While the combined rater agreement was 85 percent, this varied for different categories (see Table 3).

The first decision made by the raters was whether a statement was to be classed as a question. In many studies of teachers' questions this is presumed to be a straightforward matter, consequently no working definition is provided. In this study the concept of question was operationally defined but the agreement rate of 86 percent still indicates some difficulty in making this decision. This result may be improved following the suggestion made by Riegle (1976) that a further category of "ambiguous" be added.

Rater agreement for the concept of focus was 79 percent. This low figure was not surprising since raters had consistently reported difficulties

in this area. Some arbitrary guide lines were set by the experimenter. For example, concerning the question "What do you think about that?" The decision was made to use the context in order to ascertain whether the emphasis was upon "you", making it a case of personal focus, or upon "that", making it public focus. It is clear that fine discrimination is required for such decisions.

Table 6 which compares the proportion of disagreements contributed by each rater is informative. It is clear that Rater A made many more discrepant decisions than either of the other two. It is interesting to note that after compiling each set of results, raters discussed their differences. Most often, when rater A explained the basis for her decision, raters B and C understood her reasoning although they had made different interpretations. Despite every effort having been made to define the categories unambiguously, some distinctions are particularly difficult to make and this applies most often in the area of focus.

Another notable aspect is that the concept of focus was initially totally unfamiliar to the raters and they found it much more difficult to understand than the others. It seems that the raters as well as the subjects of the experiment found the idea of classroom questions with personal and interpersonal focus very alien.

The issue of rater agreement has been considered in some detail because of its importance in decisions regarding the generalizability of results. This is explained by Wiggins (1973).

An interest in "rater agreement" may actually be an interest in the degree to which we can generalize from a given set of ratings to those that other raters might make. (p. 285)

Table 6
Proportion of Disagreements Contributed
by Individual Raters

Rater	Statement ^a	Open - Closed	Focus	Level
A	0.42	0.52	0.71	0.74
B	0.33	0.28	0.17	0.18
C	0.25	0.20	0.12	0.08

^a'Statement' refers to the categories of interrogative question, rhetorical question or not a question.

The experimental treatment.

Aspects of the acquisition of the questioning skills will now be considered in the light of the experimental results. Although wait time measures produced the only statistical significance, the results for the other variables were also highly informative. In this section the procedural difficulties encountered in this research are outlined. Notwithstanding the pervasive effects of these difficulties, the basic questioning strategy and the microtraining approach to teaching the required skills remain viable propositions for further research.

Procedural difficulties. The research was conducted in a college with no formal structure for supporting such projects. The students who were subjects were unused to research requirements. Despite being well-meaning, they were often remiss in following directions and keeping to deadlines. Since the initial number in each group was small, experimental mortality was a serious problem.

As there was no possibility for any alteration to the college program to expedite this project, it was necessary to teach the questioning strategy within the context of a course lasting only 20 hours which also covered much other subject matter.

A further difficulty related to the availability of rooms and equipment. Although the use of videotapes for the microtraining program was preferred, it was possible only to use audiotapes.

The need for subjects to tape their own classes presented some difficulties. Unfortunately, more than half had Physical Education as their major teaching subject and found great difficulty conducting a class which was suitable for taping. In addition, the setting up and operation of a tape

recorder was a task fraught with pitfalls. There were several cases of failure to record due to machine malfunctioning. More commonly the tapes were very difficult to hear, some so difficult as to be useless for measurements of wait time and student and teacher talk time. As a result of the generally poor quality of sound, an original plan to analyze student responses was impossible to implement.

Importance of underlying belief systems. It became apparent during the training program that the tenets of humanistic education were quite unfamiliar to the majority of subjects in this study. There is only one elective taken by a small proportion of the total college population which specifically presents a humanistic pedagogy. Otherwise any familiarity with such concepts would arise from independent reading or incidental mention in general courses. Consequently it was unrealistic to expect that the concepts of personal and interpersonal focus could be taught in such a short time. Much more than the acquisition of skills was required: it was a revolution in thinking. The predominant and socially approved experience of teaching situations for these student teachers would have involved emphasis on public knowledge and information retention. This style of teaching comes naturally to them and attempts to get them to do otherwise can be very disturbing.

Aspects of the wider social context are also relevant. In recent years there have been numerous public demands for a return to orthodoxy in schools, the so called "back to basics" movement. A major Melbourne newspaper for example, over the last few months has featured articles attacking humanism in education. When these aspects of the social climate

are coupled with a high rate of unemployment amongst teachers it is not surprising that student teachers choose behavior which is familiar, acceptable and safe.

Conflicting expectations. Supervising teachers and college supervisors have a direct, strong influence on the student teachers under their care. In a critical review of the effectiveness of teacher education in America, Mackey, Glenn and Lewis (1977) state that "student teachers seem to emulate rather uncritically the model provided by their supervisors." (p.237). Even when the student teachers reject the models presented by their supervisors they often conform in order to be passed in teaching practice.

It is likely that the expectations of many supervisors are totally different from those presented in the questioning strategy training program. This is seen in the subject matter for the 73 sample classes, most of which would have been chosen by the supervisor. Classes in subjects such as Science, Mathematic, Legal Studies and Accounting covered traditional, factual material. Even in English classes where more freedom may be expected, information-giving topics such as grammar, predominated. Under these circumstances it is probable that the influence of supervisors rather than the effects of the training workshops will be reflected in the teaching styles chosen by the student teachers.

Readiness to change. Studies of student teachers' concerns emphasize that many face a struggle in terms of personal survival (Fuller and Bown, 1975). Until this issue is resolved, the needs of their own students are of lesser concern, if indeed they are considered. This suggests that teaching strategies aimed at maintaining teacher control, would take precedence

over those which emphasize the personal growth of their students. Discussions between the experimenter and subjects confirmed this expectation. Further evidence for this effect was gained from the transcripts of classes. Every question with interpersonal focus (four in number) was aimed at control of individuals or small groups. For example, one subject asked "Do you think it is fair on Donna if you sit there and make those noises while she is trying to talk?" It is apparent that student teachers at this stage need consistent support if they are to implement new ideas, especially those which have no obvious survival value.

Delayed change. Since the experimental subjects were directing most of their emotional energy toward survival, it is possible that the ideas presented at this time may remain dormant until greater confidence is attained. This was anticipated in the experimental design by including a second post-test measure. It seems likely however, that such readiness to use new skills based on acquired confidence will only occur after the first year of teaching or even later. This hope was supported by many statements made by the students who were subjects in the experiment. They were generally enthusiastic about the ideas presented and wanted to try them out. Many also expressed disappointment that the particular class they had taped did not exemplify their optimum questioning technique. (It was true that they would have had little chance to be selective about the class they taped given the time constraints). Perhaps they overestimated their skills but such statements at least indicated that they had their sights set on something higher. Many also mentioned frustration at having to teach in accordance with supervisors' expectations. Such subjective reports support the belief that the training program has sown seeds which may eventually bear fruit.

Wait time. The one measure for which statistically significant change occurred was that of wait time. The second posttest measure showed the experimental group doubling their mean pretest wait time. The pattern of results (see Figure 1) for the experimental and control groups provides a good basis for accepting a causal link with the micro-training program. (Bracht and Glass, 1968).

It is useful to consider this result in association with the trends for student and teacher talk times as seen in Table 2. Student talk times decreased slightly at each stage for both groups, with a corresponding increase in teacher talk time. It is probable that this increase was consistent with the developing confidence of the student teachers as they gained experience. Confidence alone may lead student teachers to talk more and wait less. The training program seems to have caused the experimental subjects to wait longer after asking a question, despite an overall slight increase in their talk time.

The results for wait time strengthen other arguments for the possibility of a sleeper effect for the other variables. It is likely that wait time would be the easiest of all the skills to implement since it did not require verbal classifications and constructions. Increased wait times could also occur without threat to the student teachers' class control. In fact it may have been found by some that such pauses actually helped with control.

The change in wait time may indeed be interpreted as the first stage of a process of amplification of competence. Given that success breeds greater confidence, it may only be a matter of time before the experimental subjects begin to use the other questioning skills in their classes.

Suggestions for further research.

It is apparent that the successful acquisition of the questioning skills under consideration demands much more time for the training program than was available in this study. It is desirable also that the time and program be flexible and geared to the needs of individual subjects. Ivey and Rollins (1974) have presented such a model in their "Human relations performance curriculum" which combines mastery training with training for intentionality. Unfortunately the time available for this training program was limited. Experience with mastery learning has shown that the slowest learners may take five times as long as the fastest to acquire a given skill. It would have been impossible within the existing course structure to allow for mastery. The possibility of calling for volunteers willing to commit themselves to flexible hours was not considered to be feasible, due to the difficulty of getting sufficient subjects willing to participate in the training program plus follow up measure.

In further research, efforts should be made to avoid procedural difficulties with taping. Better equipment and facilities are essential. In addition, it would be preferable for the taping to be done by an assistant, leaving the student teacher free to concentrate on teaching.

It seems likely that no procedural improvements will be effective unless the training program is embedded in an appropriate course structure. Specifically, workshops which successfully attempt to train student teachers to encourage their students to discuss feelings and personal reactions must be part of a program which fosters this in other ways. To do this effectively it may be necessary to present a theoretical approach to humanistic education before the commencement of the skills training module. This

would have the effect of keying the students to the concepts required as preparation for skills acquisition. It is anticipated that such an approach may cause subjects to perceive a discrepancy between the humanistic theory and behavioristic skills training. The work of Bradley (1977) referred to in Chapter III presents a useful rationale for synthesizing these apparently conflicting approaches.

One chance occurrence which affected the outcome of this study was the predominance of Physical Education students amongst the subjects. Although the program was designed to be suitable for teachers from any discipline, it would certainly be easier to implement the skills in discursive subjects such as Home Economics, Social Sciences and English. It may be preferable in future research to select subjects from areas more immediately amenable to the application of the skills.

The preceding discussion is based on the assumption that the instructor only needs time and opportunity to convince the students of the desirability of a humanistic approach to education. Informal conversations and class discussions with subjects of the present study revealed a range of attitudes from ready acceptance to dismissal of this approach. Those espousing the latter view tended to regard such ideas as irrelevant luxuries, perceiving their sole purpose as being to teach facts. Although future studies may be more effective in presenting a humanistic ideology, subjects retain the right to reject such an ideology in favour of their own. Thus the possibility of a mismatch between the goals of the instructor and the students in this training program still exists.

In retrospect it is apparent that the existing program required subjects to acquire a range of sophisticated skills. It may be preferable in

future studies to initially teach only open and closed questions and wait time. It is possible that there is a hierarchy of skills in operation which must be acquired in an invariant sequence. The results for wait time indicate that this is the first skill to be acquired, while common sense suggests that open and closed questions may come next. The relative positions of skills relating to focus and level on such a hierarchy are more difficult to predict.

One important factor which has been emphasised in this discussion is the readiness of the experimental subjects to learn the skills involved. It has been stated that student teachers are likely to be preoccupied with survival needs, and these needs would be felt most strongly in a classroom situation. Thus the acquisition of skills may be better tested in two stages, first by using tapes of subjects in the training workshops without the pressures of classroom management, then later by measuring the use of these skills in class.

The effects of preoccupation with survival needs may also be reduced by using experienced teachers rather than student teachers as subjects. First and second year teachers face many new stresses and may not be receptive to skills which do not directly serve such needs. For this reason it would be instructive to implement a program of training in this questioning strategy for a group of third or later year teachers. It seems likely that at this stage, having developed strategies for coping with day to day survival, they may be receptive to and able to apply new ideas aimed at improving the quality of learning experiences for their students.

The effects of this questioning strategy on individual students and on classroom dynamics should also be investigated. It was initially intended

to categorize students' responses to questions in this study, but poor quality of sound on the tapes precluded this. Subjective data from the students who are the recipients of the different kinds of questions may also be useful in such a study.

Summary.

In this chapter, aspects of the questioning strategy first proposed in Chapter III have been examined in the light of the research findings. In particular, measures of rater reliability were used as an indication of the complexity and unfamiliarity of the concept of focus.

Detailed consideration was given to the reasons for minimal change in measures of most of the variables being studied. The significant change in wait time for the experimental group was seen as particularly important as a possible forerunner to future increases in the use of other skills.

Suggestions for further research covered procedural improvements, the use of experienced teachers rather than student teachers as subjects and the investigation of school students' responses to changes in the style of questioning used by their teachers.

APPENDIX A

STUDENT WORKSHEETS USED IN THE TRAINING PROGRAM

Questioning Skills for Teachers

"The classroom teacher probably devotes more time and thought to asking questions than anybody since Socrates. One might even say the teacher is a professional question maker."

The use of questions by teachers has been extensively studied over many years. The findings have strongly supported the belief that questioning is the dominant mode of teachers' interactions with students. One study, for example, found that on average, teachers asked a question once every 72 seconds. Teacher remarks have been analyzed and discovered to consist of 54 percent questions.

Although questions may vary greatly in both their form and intended effect, unfortunately most teachers make use of a very limited range. Questions asked by teachers are predominantly of the "knowledge" kind - requiring that students reply by giving factual information which is already known to the teacher. Questions which encourage students to generalize, offer opinions, speculate or produce creative ideas are comparatively rare.

It is my belief that teachers use questions inefficiently mainly because they have never been encouraged to see the exciting potential for well-chosen, creative questioning.

We will now approach questioning as a skill which you undoubtedly possess, but which can be improved by the introduction of new ideas and practise.

Open and closed questions

An open question allows freedom for a variety of responses. The answers are often long and there is usually no right or wrong answer. A closed question allows for only a narrow range of alternative answers. The answer given is usually short and may be judged right or wrong, true or false.

Examples: (you make up numbers 2 and 3).

Open

1. What do you think of that idea?
- 2.
- 3.

Closed

Do you think that is a good or bad idea?

Exercise: "Doing the rounds". While seated in a circle, each person takes a turn at asking a closed question of the person opposite who is to answer as he/she desires. (The group is responsible for monitoring whether questions are in fact closed). Note the kind of questions, responses and how you feel while either asking or answering a question.

Repeat with a round of open questions.

Discussion

1. What were the major differences in responses to each kind of question?
2. How did you feel while answering both kinds of question?
3. Under what circumstances do you consider that open questions would be more appropriate? When would closed questions be best?

Summarize the differences in the spaces below:

OpenClosedEffectsWhen to use

Microtraining

In groups of three, designate who will be "questioner" (Q), "responder" (R) and observer/recorder (O).

Round 1: Q talks to R for three minutes, asking questions about R's experiences during teaching practise. Note, this is not expected to be a "normal" conversation and asking so many questions will probably feel a little strange. Q should try to use a variety of open and closed questions.

During this time, O records on audio cassette tape, observes and takes notes in the format supplied below.

For the next 3 - 5 minutes O plays parts of the tape, gives feedback regarding the type of questions and their effect and discusses this with the other two.

Rounds 2 and 3:

Same procedure so that each person has played each role.

Observer's GuideTally

Open _____

Closed _____

Sample questions and their effectsOther

For next class

1. Make up and bring with you two closed questions you would like someone to ask you.
2. Make up and bring with you two open questions that would help another person get to know you.
3. Now think of any topic you like teaching (or would like to teach).

Plan a. A set of five closed questions you may use to focus on key aspects.

Plan b. One open question you would expect to generate a lot of good discussion.

TRAINING IN SKILLS USEFUL FOR TEACHERS

The intention of this aspect of the course is to have you learn, practice and be able to use a variety of skills which may be useful to you as a teacher. This will probably entail looking at your existing skills in different ways and refining them, as well as learning new ones.

Intentional teaching

If the variety of skills you are at home with is increased you should be able to be more intentional in your teaching. That is, instead of saying or doing the first thing that comes to mind, you will have a range of options available to choose from. You will also be able to make the choices in ways that will lead to best results.

Spontaneity

Many people express concern that if they practice "skills" of relating and communicating with others this will destroy their spontaneity and genuineness. On the contrary, simply increasing the options available to you should not in any way act against you being genuinely yourself. There is, however, often a temporary "awkwardness" effect which can be overcome with patience and a sense of humour. The following analogy may help explain what I mean.

An analogy

Suppose you decide to take up the game of golf. You go out for a day with your friends who give you a few tips and soon you are happily swinging away and discovering a very creditable natural style. After a few more games you decide you would really like to get into this sport so you arrange a few lessons with the pro.

Misery! He changes your grip, your stance, and carves up your swing into little pieces. All of a sudden you feel totally uncoordinated and wonder why you ever wanted to play this game anyway.

At this stage you have two options: Abandon lessons and go back to your natural style or stick with it for long enough to let the new ideas be assimilated and become part of you.

Questioning skills continued

Using questions you have prepared and brought to class

- (i) Choose a partner, exchange questions and take it in turns to ask each other the two closed questions.
- (ii) Choose another partner and repeat for the open questions.
- (iii) On your own complete several statements beginning

"I learned". Make sure at least one is about yourself and one relates to the kind of question. e.g. I learned that I can be uncomfortable answering a question and still be glad I took the risk.

I learned that open questions may get brief answers if the respondent is either embarrassed by or disinterested in the subject matter.

Now yours:

I learned

I learned

- (iv) Each pair join with another pair to form fours. Discuss what you learned about questions from the first three steps. Try to limit your discussion to the present experience.

Wait time

The idea of pausing after asking a question to give the respondent time to consider a reply seems to be a matter of common sense. A woman named Mary Budd Rowe has pioneered work in studying this aspect of questioning and has discovered that often this does not happen. Analysis of teacher tapes revealed that the teachers typically waited less than one second after asking a question for a student to begin to answer. If this did not happen the teacher repeated, rephrased or redirected the question. She observed that not only did this cause teachers to work very hard (some asked as many as twelve questions in a minute), but the children showed increased breathing and sighing rates as the number of questions increased.

Following these observations, Rowe worked with a group of fifty teachers who agreed to try to extend their wait time to three seconds or more. The result was an impressive array of changes as follows:

- The length of student responses increased by 300 to 700 percent.
- The number of unsolicited but appropriate responses by students increased.
- The number of failures to respond decreased dramatically.
- Confidence, measured by non verbal indicators increased.
- The incidence of speculative thinking increased.
- Teacher centred behavior decreased and child to child comparing increased.
- The number of times children made inferences and supported them with evidence increased.
- The incidence of enquiry from children increased.
- Contributions from children formerly regarded as "slow learners" increased.
- The number of disciplinary moves decreased dramatically.
- The teachers also changed. They asked fewer questions but these were more variable and showed greater response flexibility. Their expectations for performance of certain children also seemed to change.

There are many reasons why teachers do not wait long enough for answers but they can probably be summarized as (1) not really caring to get answers (they only ask questions from habit) and (2) feeling nervous (they feel as if they are waiting a long time). The latter reason is probably very common amongst new teachers so we will attempt to overcome the nervousness by practising in non threatening circumstances.

Exercise. "Doing the rounds". This time each person will ask an open question of the person opposite. The respondent must silently count slowly to 10 before beginning to answer. The questioner is to monitor thoughts and feelings experienced during this "wait time".

Microtraining (see previous handout).

During this week

1. For every lesson you teach this week
 - (i) try to notice three questions you ask, and their effects,
 - (ii) try to wait at least 3 seconds after asking a question before doing anything else. Note any effects on you and your students.
2. For every lesson you observe this week, notice specific questions and their effects on the students. Also watch for the effects of variations in "wait time".

Bring your observations (written) to class next week.

The aim of teachers is to educate but often in practice they only instruct i.e. they treat students as empty receptacles needing to be filled with knowledge.

To truly educate, teachers must seek to "lead out" their students, to develop the potential that is within them.

The advice is often given to teachers to "start from where they're at". Generally this is taken to mean "find out how much they know about the topic and proceed from there - don't pressure them to know more than they really do". This is fair enough - as far as it goes. But where your students "are at" involves vastly more than a certain amount of knowledge on a certain topic.

Think back to when you were first at Rusden in tutorial groups. It doesn't matter how well the subject matter was geared to your level -

- if you felt very apprehensive you wouldn't speak out (feelings count)
- if you thought you weren't good at the subject you wouldn't venture an answer (your perception of yourself influences behaviour).
- if you didn't trust others not to reject your ideas you wouldn't share them (your perception of others influences your behaviour).

We could all give many examples of times when our feelings, views about ourselves and others have clearly modified our responses to learning situations. Yet, in the vast majority of such situations, those aspects of the learner are totally ignored.

The questions you ask, largely define what is to be talked about in class. You can choose to focus on the "whole person" and seek to draw out the potential that is within.

Three areas of focus

(See handout: The self, others and public knowledge).

These can be defined as follows:

Personal:

This refers to the student as a person, his or her feelings, values, strengths, vulnerabilities and ambitions. In this category it is particularly important that the reason for asking is clear and the question is not just prying. It should also be clear that the student is free to decide how much to share.

Interpersonal:

This refers to peer relations, to how individuals in a group interact and how one negotiates between being an individual and part of a whole.

Public:

This refers to knowledge outside the person and is the traditional subject matter in schools.

Examples

Personal: How did you feel when you read that article?

Interpersonal: (After working in pairs). Did you have to change any opinions to come to agreement?

Public: What was the main character's greatest virtue?

- (1) Group size and class structuring. It is easier to focus on and share personal and interpersonal knowledge in small sub-groups of a large class.
- (2) Trust. Sharing personal and interpersonal knowledge is only possible if there is a high level of trust between class members and the teacher.
- (3) Rights to privacy. Questions about personal and interpersonal issues should not be intrusive. It is probably good to think about these questions ahead of time.
- (4) Expectations. It will probably take class members a while to get used to being allowed to talk about themselves - they may misinterpret your questions initially.
- (5) Commitment needed. This kind of teaching requires a great deal of personal commitment from you.
- (6) One class is not enough. If you are interested in pursuing these ideas further, two electives you may find helpful are "The teacher and the helping relationship" and "Human relations".
- (7) Other.

Examples of questions

A miscellaneous collection that may be useful.

What is going on?
Would you be willing to try?
Can you offer a suggestion?
Can you give an example from your experience?
How did you feel about that?
What did you observe?
What does that mean to you?
How was that significant?
Was that typical of you?
What have you learned about yourself?
What have you learned about yourself in relation to others?
How could you do things differently?
What are the consequences of doing things this way?

This week

- (1) Try to ask at least one personal and interpersonal question in each class you take (they can be planned ahead of time). What happens as a result?
- (2) In any classes you observe, watch for the use of interpersonal and personal questions and their effects.

APPENDIX B

ASSIGNMENTS FOR THE EXPERIMENTAL GROUP

COURSE REQUIREMENTS

I have designed this course to be practical and relevant. Classes will usually have a workshop approach with the emphasis on sharing experiences and practising skills. For this approach to succeed, it is essential that you (1) participate in each class unless prevented by a major catastrophe and (2) complete the first two assignments by the dates given.

If you foresee any difficulties in either of these areas, please discuss them with me after the first class.

Dates for your diary

Between March 3 and 21	Record first tape.
Class of week ending March 28	Hand in Assignment 1
Class of week ending April 4	I will give you individual feedback (written) on Assignment 1.
Between April 14 and 25	Record second tape.
Class of week ending May 2	Hand in assignment 2, and tape.
Class of week ending May 9	Feedback from me on Assignment 2 Hand in Assignment 3.

My comments on Assignment 3 may be delayed because I have work commitments from May 11 to 25. I will put a notice on my door to tell you when they will be ready.

Assignments

1. (a) Make a cassette tape of $\frac{1}{2}$ hour of you teaching a class.

Please practice using the recording equipment first, to make sure it is picking up adequately. Choose a lesson where you are planning a fair amount of verbal interaction. Label the tape as follows: Group -, Side 1, date.

- (b) Make a transcript of 10 minutes of the tape, numbering each statement. Choose a period of maximum verbal interaction.

Choose 3 of your statements and write briefly your subjective impression of the effects of each statement. Hand in the transcript and subjective comments.

2. (a) Record another half hour class as before. Complete labelling of tape - Side 2, date.

(b) Make a 10 minute transcript numbering each statement as before. Directions for analysis will be printed separately. Hand in tape, transcript and analysis.
3. See accompanying sheets.

It is intended that this assignment gives you scope to use your ideas from this course and other experiences creatively. If you would like to propose an alternative assignment that would suit your needs better, please discuss this with me before Week 6.

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